

Appl. No. 10/058,324
Amendment dated
Reply to Office Action of June 4, 2003

Amendments to the Claims:

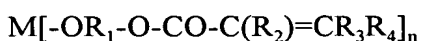
This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1 - 10 (Canceled)

11. (New) A method for providing organic/inorganic hybrid materials comprising:

A) hydrolyzing a metal aliphatic acryl alkoxide of the formula:



wherein:

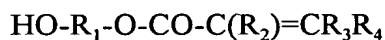
M is a metal element or mixture of metal elements,

R₁ is an alkyl group,

R₂, R₃, and R₄ are independently selected from the group consisting of hydrogen and alkyl, and

n is a number in the range of from 1 to 12,

to form *in situ* a nanosized oxide of the metal(s), M, uniformly dispersed in a matrix comprising an acrylate monomer of the formula:



wherein:

R₁, R₂, R₃, and R₄ are as defined above; and

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B) curing the product of step A) in the presence of a free radical polymerization initiator.

12. (New) The method of claim 11 wherein M is a non-toxic metal and has an atomic number greater than that of silicon.

13. (New) The method of claim 12 wherein M is selected from the group consisting of titanium, bismuth, and mixtures thereof.

14. (New) The method of claim 11 wherein R₁ is alkyl of from 1 to 12 carbon atoms.

15. (New) The method of claim 14 wherein R₁ is a straight chain alkyl group.

16. (New) The method of claim 11 wherein R₂, R₃, and R₄ are independently selected from the group consisting of hydrogen, straight chain alkyl groups, and branched chain alkyl groups.

17. (New) The method of claim 16 wherein R₂ is methyl.

18. (New) The method of claim 17 wherein R₃ and R₄ are hydrogen.

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19. (New) The method of claim 11 wherein the hydrolysis is catalyzed by an inorganic or organic acid.

20. (New) The method of claim 11 wherein the hydrolysis is catalyzed by an inorganic or organic base.

21. (New) The method of claim 11 wherein the free radical polymerization initiator is a photoinitiator.

22. (New) The method of claim 21 wherein the photoinitiator is 2,2-dimethoxy-2-phenyl acetophenone.

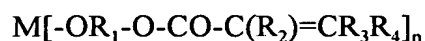
23. (New) The method of claim 11 wherein the free radical polymerization initiator is a thermal initiator.

24. (New) The method of claim 23 wherein the thermal initiator is 2,2'-azobis(isobutyronitrile).

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25. (New) A composition of matter comprising an organic/inorganic hybrid prepared by a process comprising:

A) hydrolyzing a metal aliphatic acryl alkoxide of the formula:



wherein:

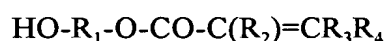
M is a metal element or mixture of metal elements,

R₁ is an alkyl group,

R₂, R₃, and R₄ are independently selected from the group consisting of hydrogen and alkyl, and

n is a number in the range of from 1 to 12,

to form *in situ* a nanosized oxide of the metal(s), M, uniformly dispersed in a matrix comprising an acrylate monomer of the formula:



wherein:

R₁, R₂, R₃, and R₄ are as defined above; and

B) curing the product of step A) in the presence of a free radical polymerization initiator.

26. (New) The composition of claim 25 wherein M is a non-toxic metal and has an atomic number greater than that of silicon.

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27. (New) The composition of claim 26 wherein M is selected from the group consisting of titanium, bismuth, and mixtures thereof.
28. (New) The composition of claim 25 wherein R₁ is alkyl of from 1 to 12 carbon atoms.
29. (New) The composition of claim 28 wherein R₁ is a straight chain alkyl group.
30. (New) The composition of claim 25 wherein R₂, R₃, and R₄ are independently selected from the group consisting of hydrogen, straight chain alkyl groups, and branched chain alkyl groups.
31. (New) The composition of claim 30 wherein R₂ is methyl.
32. (New) The composition of claim 31 wherein R₃ and R₄ are hydrogen.
33. (New) The composition of claim 25 wherein the hydrolysis is catalyzed by an inorganic or organic acid.
34. (New) The composition of claim 25 wherein the hydrolysis is catalyzed by an inorganic or organic base.

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35. (New) The composition of claim 25 wherein the free radical polymerization initiator is a photoinitiator.

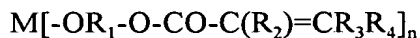
36. (New) The composition of claim 35 wherein the photoinitiator is 2,2-dimethoxy-2-phenyl acetophenone.

37. (New) The composition of claim 25 wherein the free radical polymerization initiator is a thermal initiator.

38. (New) The composition of claim 37 wherein the thermal initiator is 2,2'-azobis(isobutyronitrile).

39. (New) An article of manufacture comprising a composition comprising an organic/inorganic hybrid prepared by a process comprising:

A) hydrolyzing a metal aliphatic acryl alkoxide of the formula:



wherein:

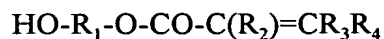
M is a metal element or mixture of metal elements,

R₁ is an alkyl group,

R₂, R₃, and R₄ are independently selected from the group consisting of hydrogen and alkyl, and

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n is a number in the range of from 1 to 12,
to form *in situ* a nanosized oxide of the metal(s), M, uniformly dispersed in a matrix
comprising an acrylate monomer of the formula:



wherein:

R₁, R₂, R₃, and R₄ are as defined above; and

B) curing the product of step A) in the presence of a free radical polymerization
initiator.

40. (New) The article of claim 39 wherein said article is selected from the group
consisting of filters, transmitters, reflectors, lenses, optical waveguides, sensors, adhesives for
optical component and device assemblies, index matched materials for solid state lasers, and
optical components.